

Riverbank Army Ammunition Plant
Riverbank
Stanislaus County
California

HAER No. CA-28

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, DC 20013-7127

HISTORIC AMERICAN ENGINEERING RECORD

Riverbank Army Ammunition Plant

CA-28

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Location: In Stanislaus County, California, near Riverbank, in the northern San Joaquin Valley, approximately ninety miles east of San Francisco. Bounded by Clause Road on the west and Claribel Road on the south.

Date of Construction:

Owner: Department of the Army

Significance: Riverbank Army Ammunition Plant began operation as an aluminum reduction facility during World War II. Idle until the Korean War, the plant was converted to an Army Ammunition plant in 1951 for the manufacture of steel cartridge cases.

Historical Report
Prepared by:

Stuart MacDonald, 1984.

Prepared for
Transmittal by:

Robie S. Lange, HABS/HAER, 1985.

EXECUTIVE SUMMARY

The Riverbank Army Ammunition Plant (RBAAP) was one of several aluminum reduction plants built in the western United States at the onset of World War II. Begun in 1942, it closed in 1944 and remained idle until the Korean War. At that time, all of the original aluminum production equipment was replaced, and the plant converted to manufacturing 90-mm and 105-mm cartridge cases and U.S. Navy 3"/50 and 5"/38 caliber cases. The plant was reactivated during the Vietnam War for major production runs of 105-mm cartridge cases and 60-mm and 81-mm mortar projectiles, and has remained in active but reduced service as part of the Army's Armament, Munitions and Chemical Command (AMCCOM). Current production includes 81-mm mortar projectiles and M/42 and M/46 grenade-body assemblies. Located on a flat, 172.71-acre site in the northern San Joaquin Valley, near the town of Riverbank, California, the facility presently comprises 134 utilitarian buildings, 19 of which date from World War II. There are no Category I, II, or III historic properties at the Riverbank Army Ammunition Plant.

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PREFACE

This report presents the results of an historic properties survey of the Riverbank Army Ammunition Plant (RBAAP). Prepared for the United States Army Materiel Development and Readiness Command (DARCOM), the report is intended to assist the Army in bringing this installation into compliance with the National Historic Preservation Act of 1966 and its amendments, and related federal laws and regulations. To this end, the report focuses on the identification, evaluation, documentation, nomination, and preservation of historic properties at the RBAAP. Chapter 1 sets forth the survey's scope and methodology; Chapter 2 presents an architectural, historical, and technological overview of the installation and its properties; and Chapter 3 identifies significant properties by Army category and sets forth preservation recommendations. Illustrations and an annotated bibliography supplement the text.

This report is part of a program initiated through a memorandum of agreement between the National Park Service, Department of the Interior, and the U.S. Department of the Army. The program covers 74 DARCOM installations and has two components: 1) a survey of historic properties (districts, buildings, structures, and objects), and 2) the development of archaeological overviews. Stanley H. Fried, Chief, Real Estate Branch of Headquarters DARCOM, directed the program for the Army, and Dr. Robert J. Kapsch, Chief of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) directed the program for the National Park Service. Sally Kress Tompkins was program manager, and Robie S. Lange was

project manager for the historic properties survey. Technical assistance was provided by Donald C. Jackson.

Building Technology Incorporated acted as primary contractor to HABS/HAER for the historic properties survey. William A. Brenner was BTI's principal-in-charge and Dr. Larry D. Lankton was the chief technical consultant. Major subcontractors were the MacDonald and Mack Partnership and Jeffrey A. Hess. The author of this report was Stuart MacDonald. The author gratefully acknowledges the help of Alfred A. Eggleston, Plant Commander's Representative; Dennis Armstrong, Plant Equipment Manager; and John E. Decker, Facilities Engineer, Norris Industries, RBAAP.

The complete HABS/HAER documentation for this installation will be included in the HABS/HAER collections at the Library of Congress, Prints and Photographs Division, under the designation HAER No. CA-28.

Chapter 1

INTRODUCTION

SCOPE

This report is based on an historic properties survey conducted in 1983 of all Army-owned properties located within the official boundaries of the Riverbank Army Ammunition Plant (RBAAP). The survey included the following tasks:

- . Completion of documentary research on the history of the installation and its properties.
- . Completion of a field inventory of all properties at the installation.
- . Preparation of a combined architectural, historical, and technological overview for the installation.
- . Evaluation of historic properties and development of recommendations for preservation of these properties.

Also completed as a part of the historic properties survey of the installation, but not included in this report, are HABS/HAER Inventory cards for 18 individual properties. These cards, which constitute HABS/HAER Documentation Level IV, will be provided to the Department of the Army. Archival copies of the cards, with their accompanying photographic

negatives, will be transmitted to the HABS/HAER collections at the Library of Congress.

The methodology used to complete these tasks is described in the following section of this report.

METHODOLOGY

1. Documentary Research

A concerted effort was made to locate published and unpublished sources dealing specifically with the history and technology of the Riverbank Army Ammunition Plant (RBAAP). This site specific research was conducted primarily at the AMCCOM Historical Office at Rock Island Arsenal, Rock Island, Illinois; the Modesto-Stanislaus Library; and the RBAAP government and contractor files.

On the basis of this literature search, a number of valuable sources were identified, including World-War-II-era construction drawings prepared by the original contractor-operator. The California State Historic Preservation Office had no pertinent information.

Army records used for the field inventory included current Real Property Inventory (RPI) printouts that listed all officially recorded buildings and structures by facility classification and date of construction; the installation's property record cards; base maps and photographs supplied by installation personnel; and installation

master planning, archaeological, environmental assessment, and related reports and documents. A complete listing of this documentary material may be found in the bibliography.

2. Field Inventory

Architectural and technological field surveys were conducted in September, 1983, by Stuart MacDonald. Following general discussions, Dennis Armstrong, Plant Equipment Manager, conducted a comprehensive tour of the production facilities and explained the methods of production. Subsequently, the surveyor was permitted access to all exterior areas without escort.

Field inventory procedures were based on the HABS/HAER Guidelines for Inventories of Historic Buildings and Engineering and Industrial Structures.¹ All areas and properties were visually surveyed.

Building locations and approximate dates of construction were noted from the installation's property records and field-verified. Interior surveys were made of the major facilities to permit adequate evaluation of architectural features, building technology, and production equipment.

Field inventory forms were prepared for, and black and white 35 mm photographs taken of all buildings and structures through 1945 except basic utilitarian structures of no architectural, historical, or technological interest. When groups of similar ("prototypical") buildings were found, one field form was normally prepared to

represent all buildings of that type. Field inventory forms were also completed for representative post-1945 buildings and structures.² Information collected on the field forms was later evaluated, condensed, and transferred to HABS/HAER Inventory cards.

3. Historical Overview

A combined architectural, historical, and technological overview was prepared from information developed from the documentary research and the field inventory. It was written in two parts: 1) an introductory description of the installation, and 2) a history of the installation by periods of development, beginning with pre-military land uses. Maps and photographs were selected to supplement the text as appropriate.

The objectives of the overview were to 1) establish the periods of major construction at the installation, 2) identify important events and individuals associated with specific historic properties, 3) describe patterns and locations of historic property types, and 4) analyze specific building and industrial technologies employed at the installation.

4. Property Evaluation and Preservation Measures

Based on information developed in the historical overviews, properties were first evaluated for historical significance in accordance with the eligibility criteria for nomination to the National Register of

Historic Places. These criteria require that eligible properties possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that they meet one or more of the following:³

- A. Are associated with events that have made a significant contribution to the broad patterns of our history.
- B. Are associated with the lives of persons significant in the nation's past.
- C. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction.
- D. Have yielded, or may be likely to yield, information important in pre-history or history.

Properties thus evaluated were further assessed for placement in one of five Army historic property categories as described in Army Regulation 420-40:⁴

- Category I Properties of major importance
- Category II Properties of importance
- Category III Properties of minor importance

- Category IV Properties of little or no importance
- Category V Properties detrimental to the significance
of adjacent historic properties.

Based on an extensive review of the architectural, historical, and technological resources identified on DARCOM installations nationwide, four criteria were developed to help determine the appropriate categorization level for each Army property. These criteria were used to assess the importance not only of properties of traditional historical interest, but also of the vast number of standardized or prototypical buildings, structures and production processes that were built and put into service during World War II, as well as of properties associated with many post-war technological achievements. The four criteria were often used in combination and are as follows:

- 1) Degree of importance as a work of architectural, engineering, or industrial design. This criterion took into account the qualitative factors by which design is normally judged: artistic merit, workmanship, appropriate use of materials, and functionality.
- 2) Degree of rarity as a remaining example of a once widely used architectural, engineering, or industrial design or process. This criterion was applied primarily to the many standardized or prototypical DARCOM buildings, structures, or industrial processes. The more widespread or influential the design or process, the greater the importance of the remaining examples

of the design or process was considered to be. This criterion was also used for non-military structures such as farmhouses and other once prevalent building types.

- 3) Degree of integrity or completeness. This criterion compared the current condition, appearance, and function of a building, structure, architectural assemblage, or industrial process to its original or most historically important condition, appearance, and function. Those properties that were highly intact were generally considered of greater importance than those that were not.
- 4) Degree of association with an important person, program, or event. This criterion was used to examine the relationship of a property to a famous personage, wartime project, or similar factor that lent the property special importance.

The majority of DARCOM properties were built just prior to or during World War II, and special attention was given to their evaluation. Those that still remain do not often possess individual importance, but collectively they represent the remnants of a vast construction undertaking whose architectural, historical, and technological importance needed to be assessed before their numbers diminished further. This assessment centered on an extensive review of the military construction of the 1940-1945 period, and its contribution to the history of World War II and the post-war Army landscape.

Because technology has advanced so rapidly since the war, post-World War II properties were also given attention. These properties were evaluated in terms of the nation's more recent accomplishments in weaponry, rocketry, electronics, and related technological and scientific endeavors. Thus the traditional definition of "historic" as a property 50 or more years old was not germane in the assessment of either World War II or post-war DARCOM buildings and structures; rather, the historic importance of all properties was evaluated as completely as possible regardless of age.

Property designations by category are expected to be useful for approximately ten years, after which all categorizations should be reviewed and updated.

Following this categorization procedure, Category I, II, and III historic properties were analyzed in terms of:

- . Current structural condition and state of repair. This information was taken from the field inventory forms and photographs, and was often supplemented by rechecking with facilities engineering personnel.
- . The nature of possible future adverse impacts to the property. This information was gathered from the installation's master planning documents and rechecked with facilities engineering personnel.

Based on the above considerations, the general preservation recommendations presented in Chapter 3 for Category I, II, and III historic properties were developed. Special preservation recommendations were created for individual properties as circumstances required.

5. Report Review

Prior to being completed in final form, this report was subjected to an in-house review by Building Technology Incorporated. It was then sent in draft to the subject installation for comment and clearance and, with its associated historical materials, to HABS/HAER staff for technical review. When the installation cleared the report, additional draft copies were sent to DARCOM, the appropriate State Historic Preservation Officer, and, when requested, to the archaeological contractor performing parallel work at the installation. The report was revised based on all comments collected, then published in final form.

NOTES

1. Historic American Buildings Survey/Historic American Engineering Record, National Park Service, Guidelines for Inventories of Historic Buildings and Engineering and Industrial Structures (unpublished draft, 1982).
2. Representative post-World War II buildings and structures were defined as properties that were: (a) "representative" by virtue of construction type, architectural type, function, or a combination of these, (b) of obvious Category I, II, or III historic importance, or (c) prominent on the installation by virtue of size, location, or other distinctive feature.

3. National Park Service, How to Complete National Register Forms
(Washington, D.C.: U.S. Government Printing Office, January 1977).
4. Army Regulation 420-40, Historic Preservation (Headquarters, U.S.
Army: Washington, D.C., 15 April 1984).

Chapter 2

HISTORICAL OVERVIEW

BACKGROUND

The Riverbank Army Ammunition Plant (RBAAP) is a government-owned, contractor-operated installation situated on 172.71 acres¹ in Stanislaus County near Riverbank, California, in the northern San Joaquin Valley, approximately 90 miles east of San Francisco (Figure 1). Its terrain is flat. The plant, financed by the Defense Plant Corporation, was constructed in 1942. It began operation under the direction of ALCOA as an aluminum reduction facility in 1943, and was shut down in 1944. The plant remained idle until 1951-1952 when it was converted to an Army ammunition plant for the manufacture of steel cartridge cases. It was closed in 1958, reactivated in 1966, and has remained in operation since that time, producing shell and mortar casings and related metal parts.

At present, the RBAAP comprises 134 buildings, 19 of which date from the original construction period (Figures 2, 3). Although all major World-War-II-era production buildings remain, the plant's original aluminum production machinery has been replaced.

PRE-MILITARY LAND USE

Prior to the Defense Plant Corporation's acquisition in 1941,² the land had been used primarily for agricultural purposes. Recorded settlement began

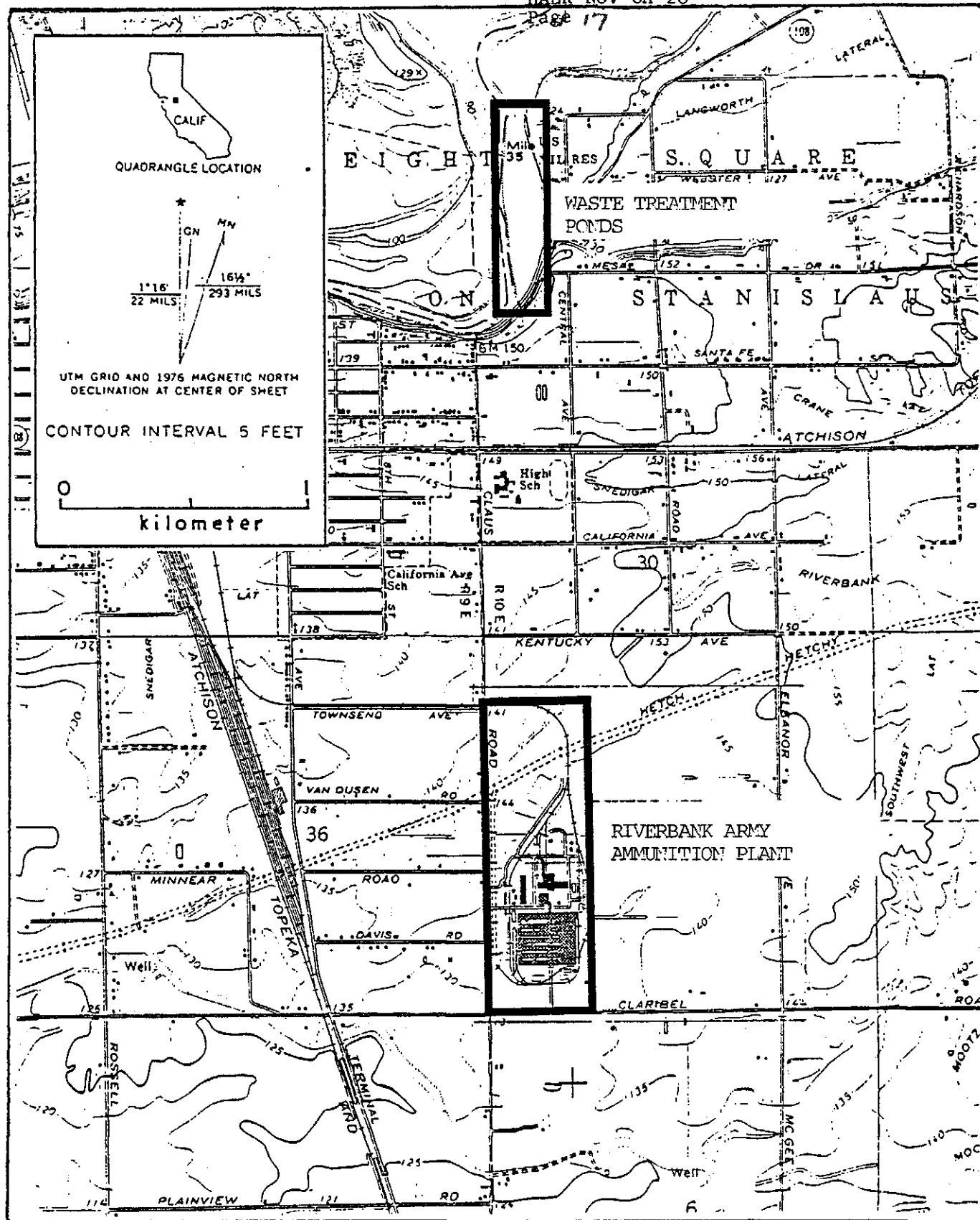


Figure 1: Riverbank Army Ammunition Plant. Location map. (Source: USGS Riverbank, California, 7.5 Minute Quadrangle.)

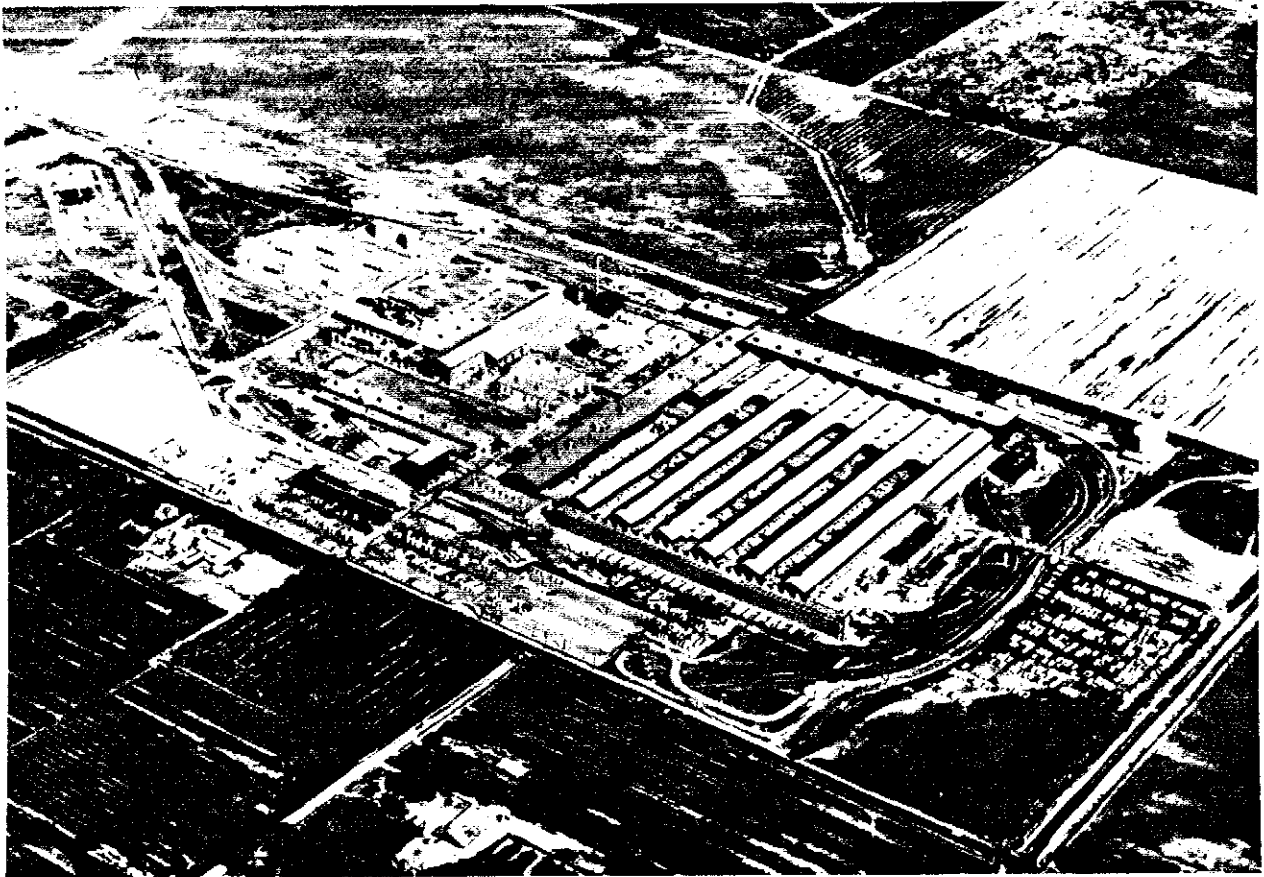


Figure 2: RBAAP, looking northeast, 1967-1968.
(Source: RBAAP.)

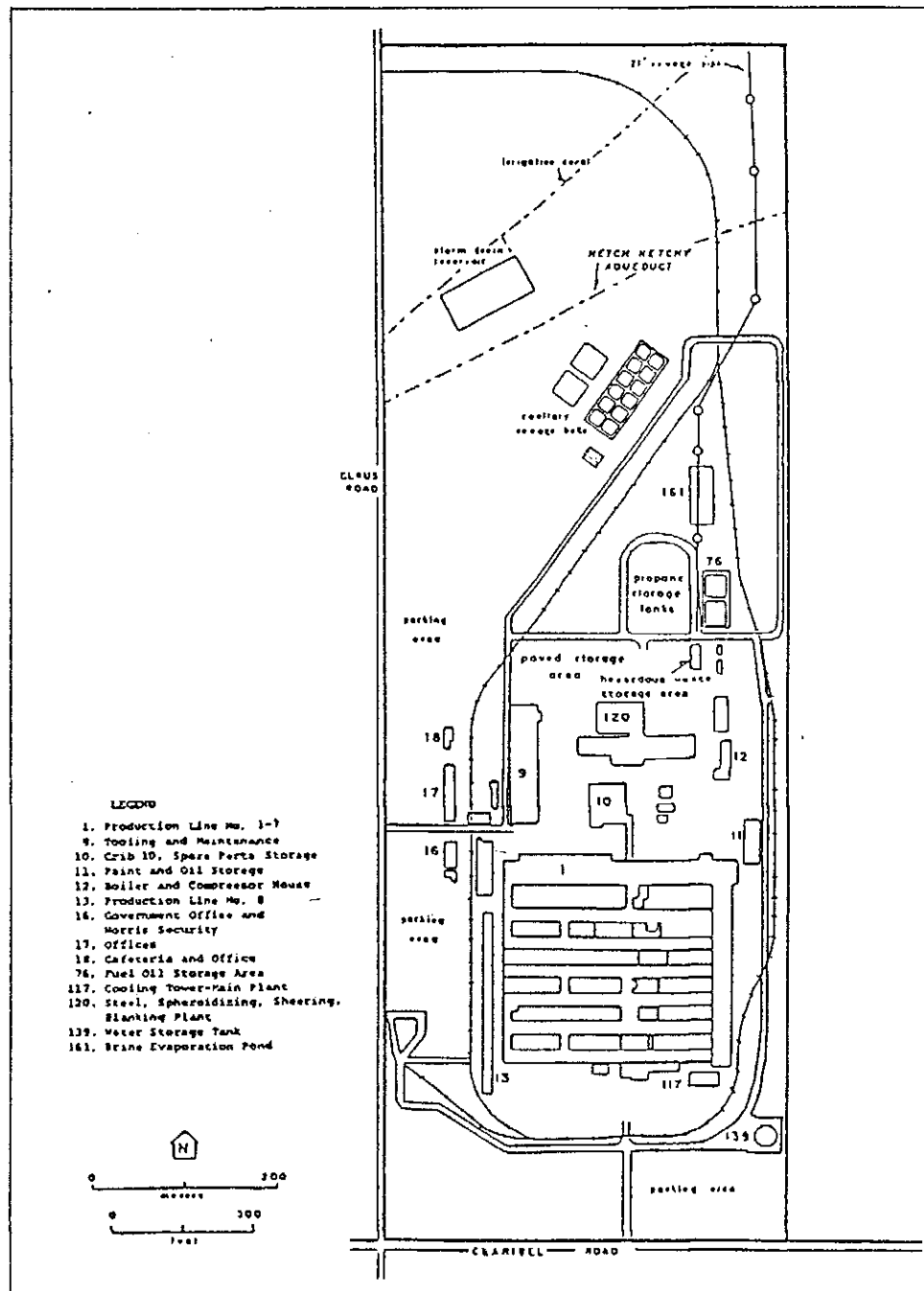


Figure 3: RBAAP site plan, 1983.
(Source: RBAAP.)

in 1876 when Daniel H. Grubb purchased and began farming a portion of the present installation site. Succeeding owners included large landholders, ranchers, and farmers. A house, barn, and associated out-buildings have been identified from this initial period; however, all have been eliminated from the site.³

WORLD WAR II

When war broke out in Europe in the fall of 1939, the United States had limited industrial capacity for producing aluminum, a material crucial for aircraft manufacture. To remedy this deficiency, a series of aluminum production facilities was built from 1939 through 1942 with financing from the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation. Most plants were located in the western United States and were designed, built, and operated by the Aluminum Company of America (ALCOA). During these years, United States aluminum production increased fivefold.⁴

Authorization for ALCOA's aluminum reduction plant near Riverbank, California, was approved August 19, 1941.⁵ In 1942 a total of 27 buildings were constructed on a site selected for its proximity to the transportation facilities of the Atchison, Topeka & Santa Fe Railway. Since aluminum is refined electrolytically, the site was also chosen for its proximity to the Hetch Hetchy power transmission line, which provided abundant hydroelectric power. Annual aluminum production capacity was 96,000,000 pounds.⁶

The plant's layout featured a standard, parallel arrangement of six linear, one-story, steel-frame "Pot Rooms" (Buildings 1, 2, 3, 4, 5, 6) supplied from silo-like ore tanks fed by an overhead rail conveying system (Figures 4, 5, 6).⁷ The Pot Rooms were 46 feet by 743 feet each. Together they housed 384 melting pots in which pure alumina was electrolytically reduced in a bath of fused cryolite to produce metallic aluminum.⁸ Electrical power was distributed from the 32-foot-by-648-foot, two-story brick Rectifier Building (Building 13), which was set perpendicular to the Pot Rooms (Figures 7, 8).⁹ Additional major structures were the Metal Service Building (Building 8/Figure 9), Carbon Rodding Building (Building 7), Carbon Unloading and Shipping Building (Building 10/Figure 10), Ore Unloading Building (Building 11), Machine Shop (Building 9/Figure 11), and a group of one-story, brick administrative structures, including Offices (Buildings 16, 17), Dispensary/Washroom (Building 14), and Cafeteria (Building 18/Figure 12). Keystoned, splayed lintels at doors and windows reflected an attention to the architectural appearance of the administrative structures; all others, however, were strictly utilitarian in style.

The Riverbank aluminum plant "was phased out of aluminum production in August 1944, when the bulk of the American WW2 air fleet had been constructed, and the war in Europe was nearing an end."¹⁰ The plant was declared war-surplus, and the Kaiser Corporation bought its aluminum production equipment.¹¹ Despite a concerted effort by the Stanislaus County Board of Supervisors to find a replacement industry, the physical plant remained idle.¹²

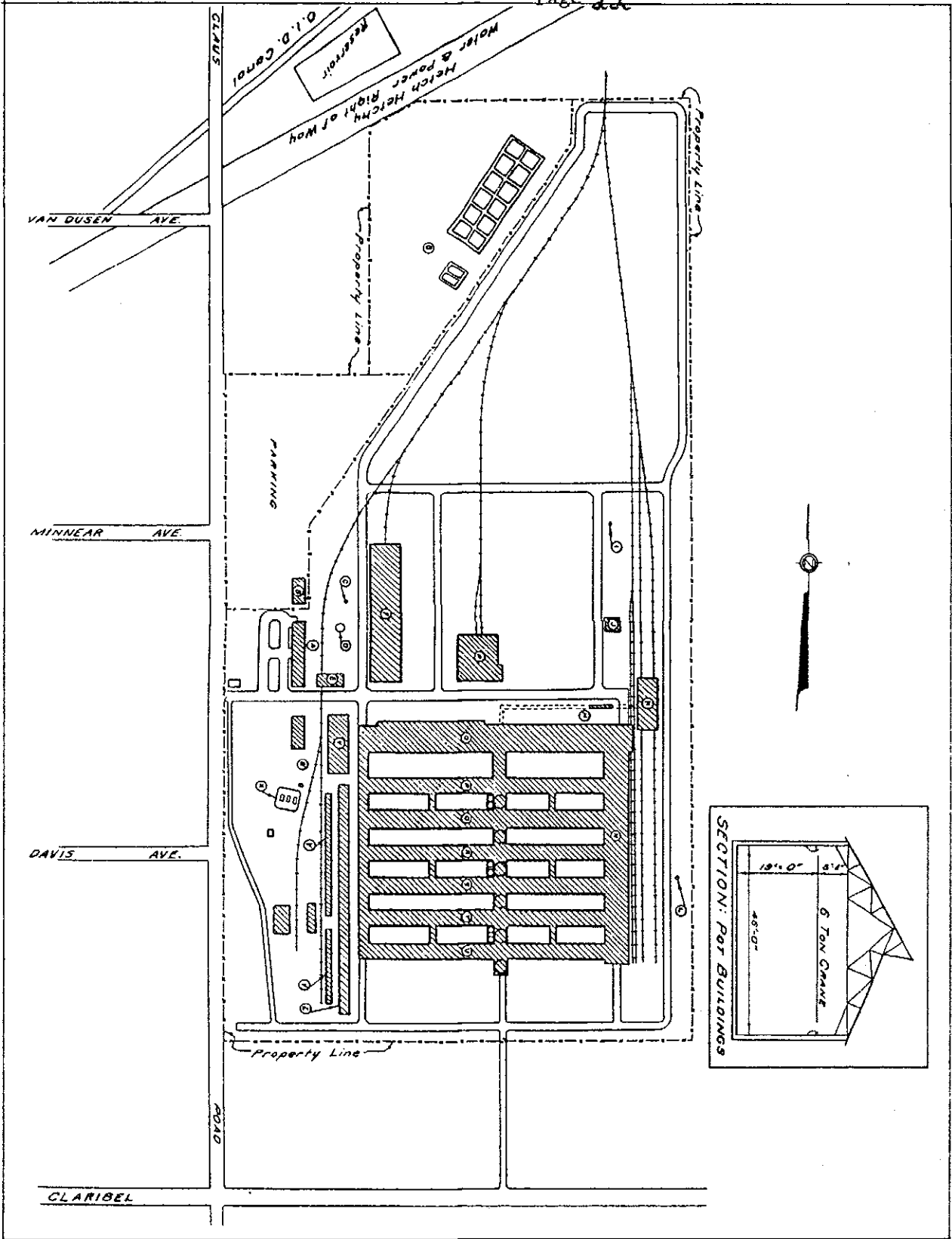


Figure 4: RBAAP site plan, 1950. (Source: "Riverbank Aluminum Plant.")

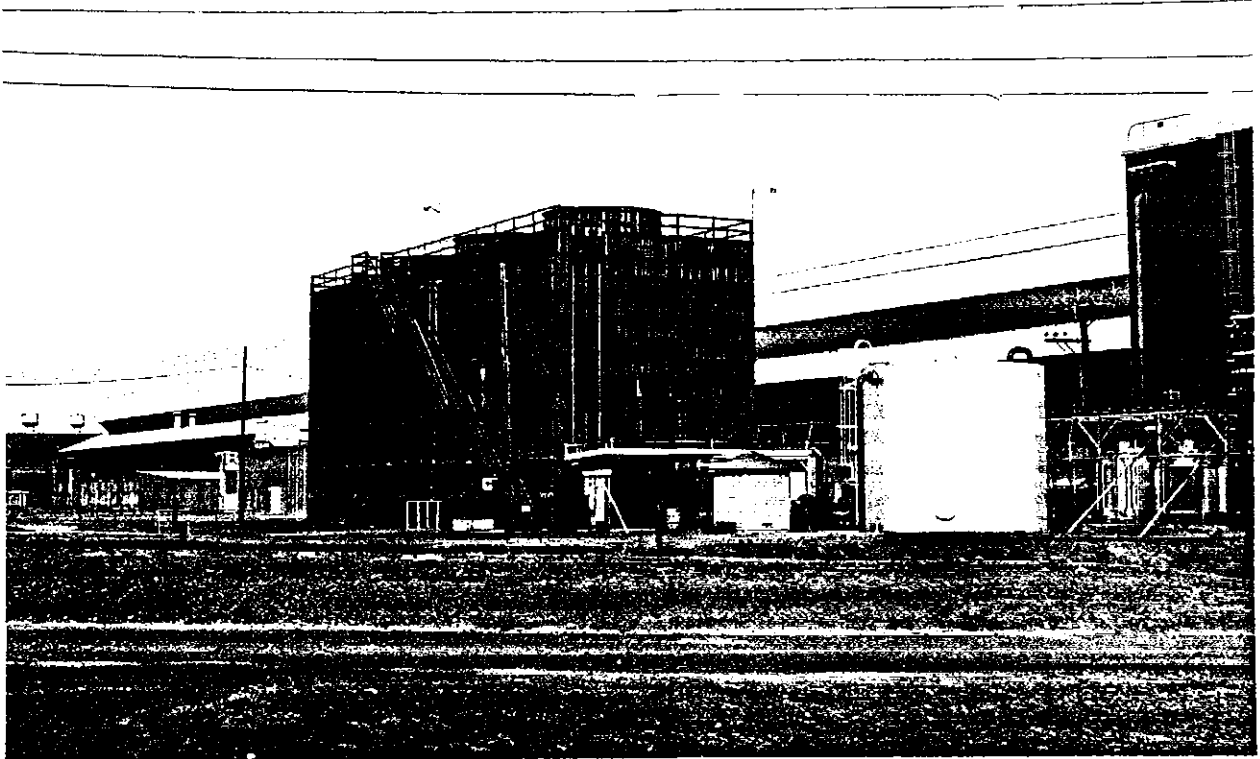


Figure 5: RBAAP, Production Line 6, Building 6, south elevation. Cooling Tower (Building 117) in foreground. (Source: Field inventory photograph, 1983, Stuart MacDonald, MacDonald and Mack Partnership.)

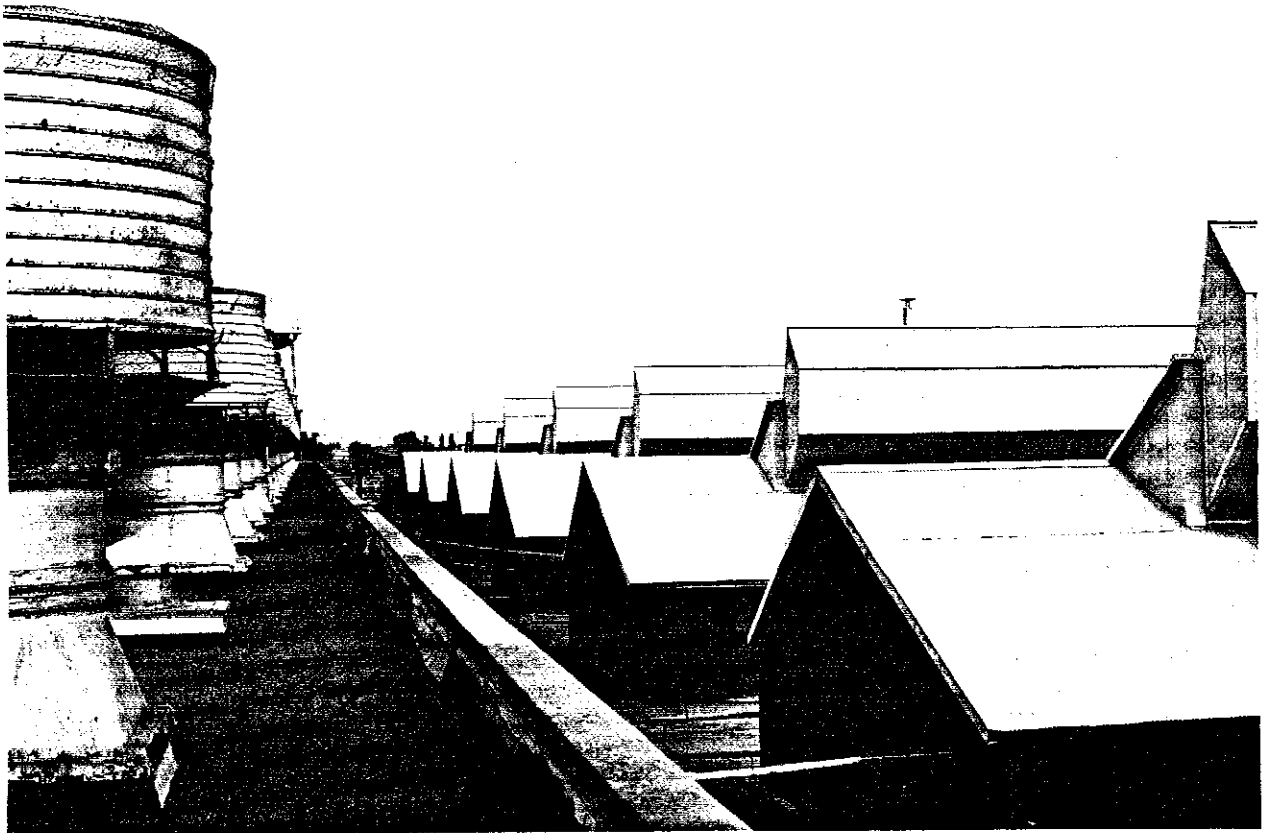


Figure 6: RBAAP, Buildings 1 through 6, looking east from roof of Building 13. (Source: Field inventory photograph, 1983, Stuart MacDonald, MacDonald and Mack Partnership.)

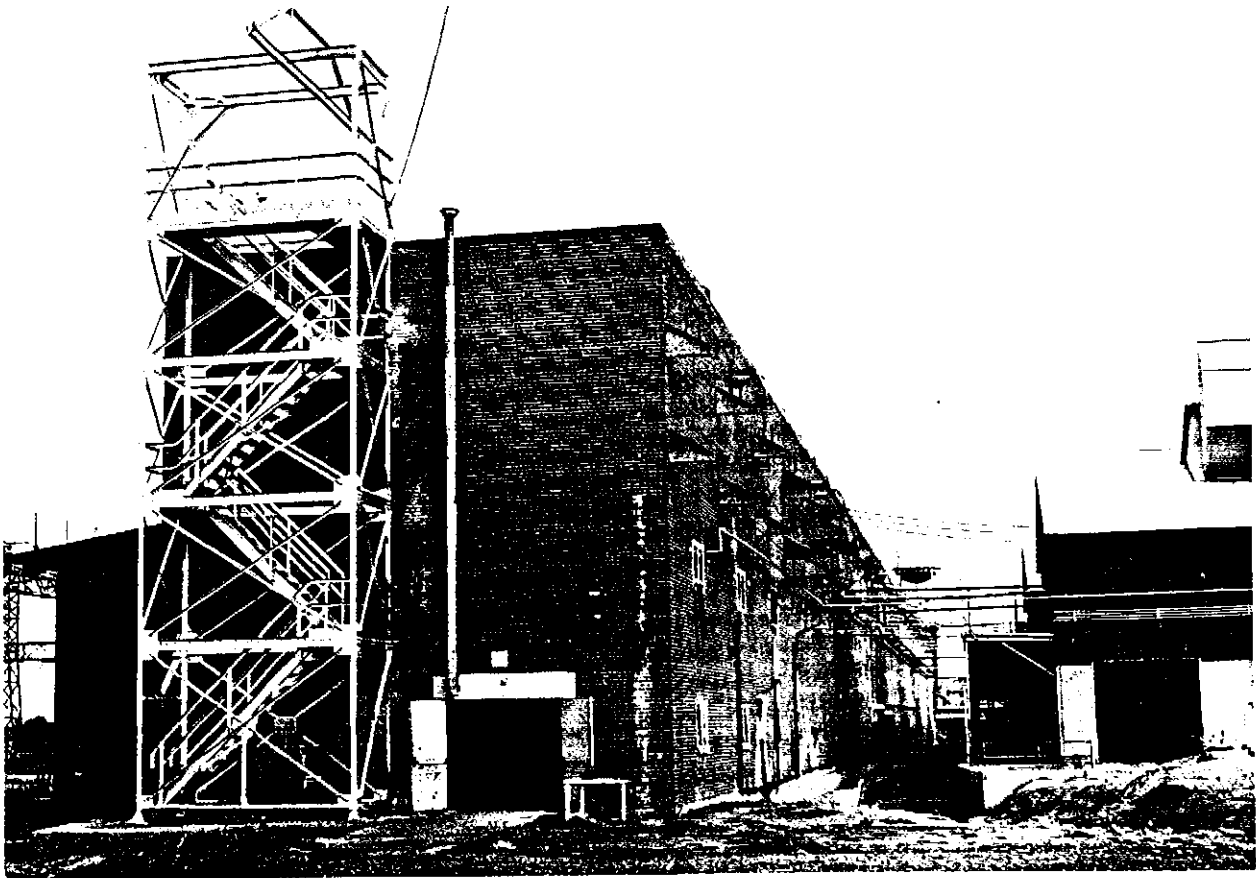


Figure 7: RBAAP, Production Line 8, Building 13, south and east elevations. (Source: Field inventory photograph, 1983, Stuart MacDonald, MacDonald and Mack Partnership.)

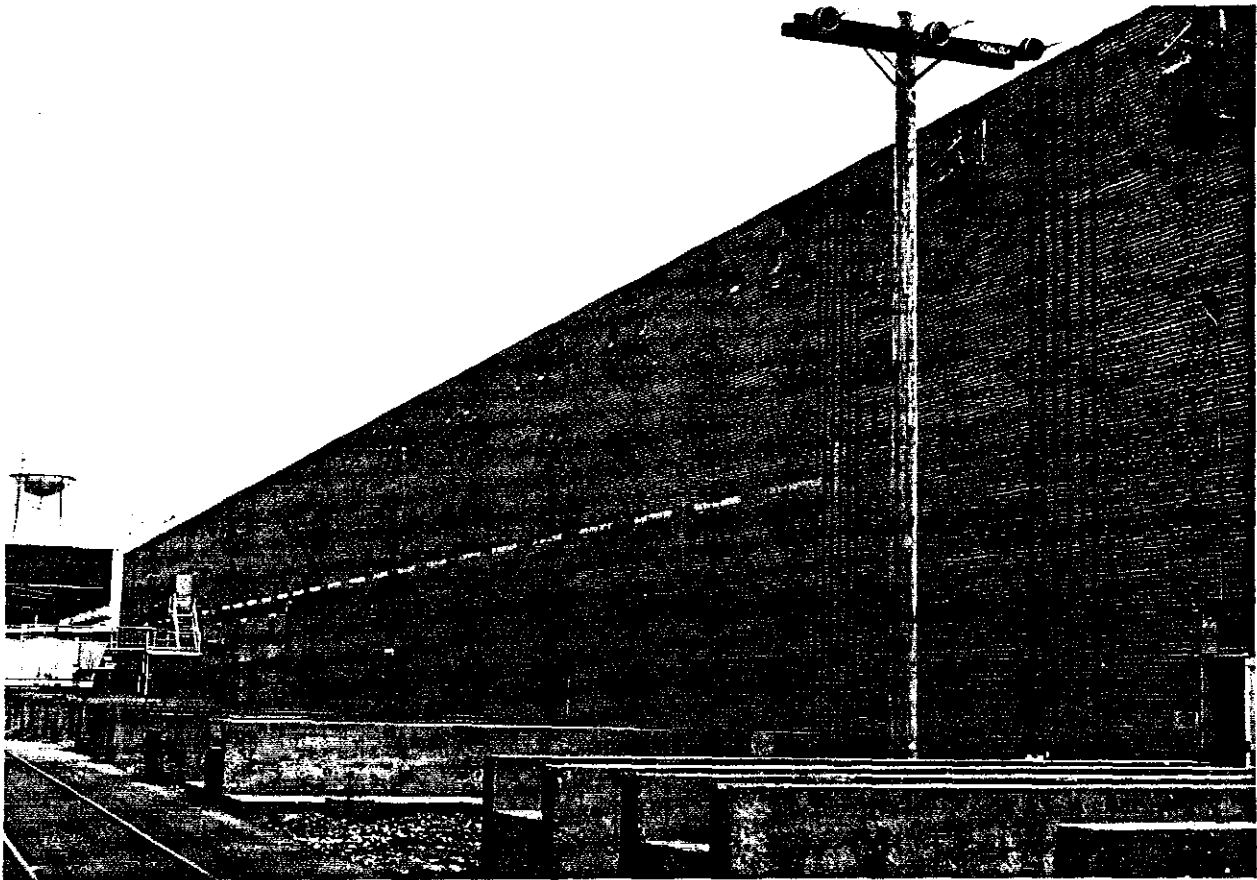


Figure 8: RBAAP, Production Line 8, Building 13, west elevation.
(Source: Field inventory photograph, 1983, Stuart
MacDonald, MacDonald and Mack Partnership.)

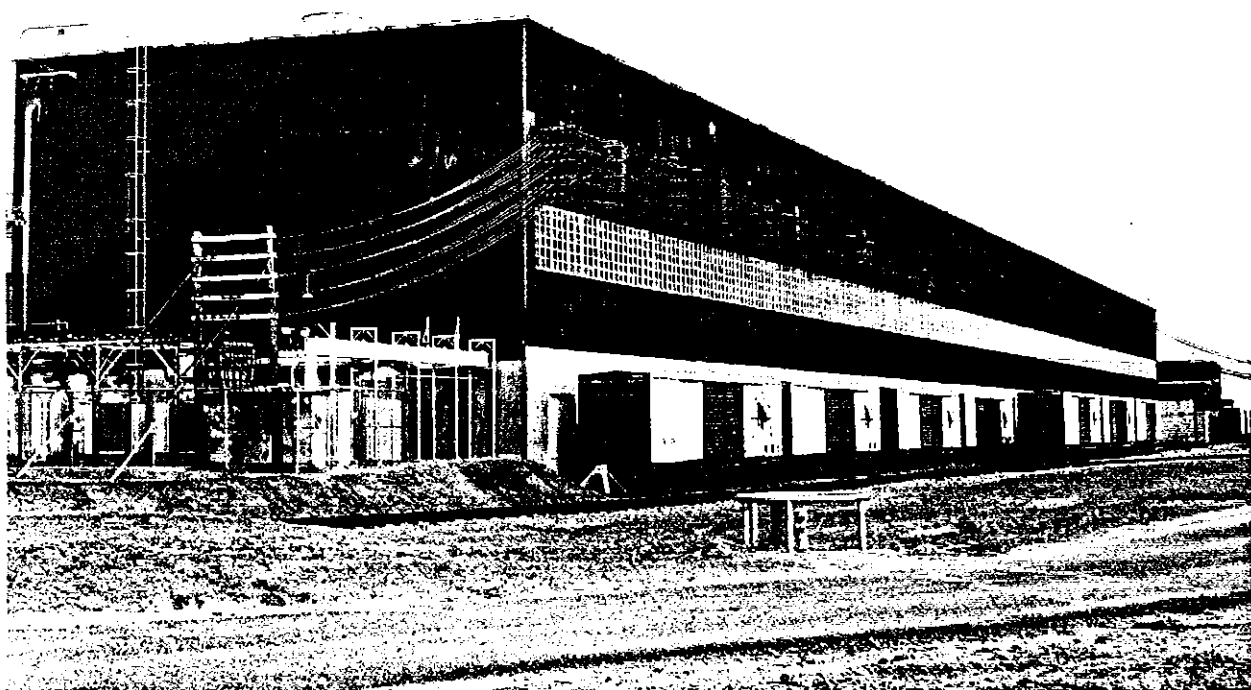


Figure 9: RBAAP, Press Room (Building 8), south and east elevations.
(Source: Field inventory photograph, 1983, Stuart
MacDonald, MacDonald and Mack Partnership.)



Figure 10: RBAAP, General Purpose Warehouse (Building 10), south and west elevations. (Source: Field inventory photograph, 1983, Stuart MacDonald, MacDonald and Mack Partnership.)



Figure 11: RBAAP, Machine Shop (Building 9), north elevation.
(Source: Field inventory photograph, 1983, Stuart
MacDonald, MacDonald and Mack Partnership.)



Figure 12: RBAAP, Cafeteria and Office (Building 18), west elevation.
(Source: Field inventory photograph, 1983, Stuart
MacDonald, MacDonald and Mack Partnership.)

KOREAN WAR

In 1951 the installation converted to steel cartridge case manufacture, and in 1952 was reactivated as the Riverbank Army Ammunition Plant (RBAAP), the world's largest shell-casing plant at that time.¹³ Norris Industries, an experienced munitions contractor with particular expertise in metal parts manufacturing, operated the plant.¹⁴

Norris assigned major construction activities and the establishment and installation of six production lines to the Bechtel Corporation.¹⁵

Building 120 was erected to house heat-treat furnaces (Figure 13), Building 3 was enlarged to accommodate presses, and Buildings 1, 2, 3, 4, 5, and 6 were outfitted to produce 90-mm and 105-mm cartridge cases and U.S. Navy 3"/50 and 5"/38 caliber cases.¹⁶ Production began September 19, 1952, and exceeded 12 million cases by the end of the Korean War.¹⁷

The RBAAP remained in diminished operation until 1958 when it was deactivated and placed on standby status. For a second time, in 1963, the installation was declared surplus and unsuccessfully put up for sale.¹⁸

VIETNAM WAR

In June 1966, the RBAAP was reactivated for the Vietnam War.¹⁹ Norris Industries operated the plant and continued its association with the Bechtel Corporation. Bechtel reactivated four, 105-mm cartridge case lines (Buildings 1, 2, 3, 4) and established and installed equipment for



Figure 13: RBAAP, Blanking Plant/Furnace Building (Building 120), north elevation. (Source: Field inventory photograph, 1983, Stuart MacDonald, MacDonald and Mack Partnership.)

producing 60-mm mortar projectiles (Building 1) and 81-mm mortar projectiles (Building 7).²⁰ Through September 1975, plant output exceeded 32 million cases and 23 million projectiles.²¹ No major building construction occurred during this period.

RECENT DEVELOPMENTS

The RBAAP has remained in operation but its production is well below full capacity. Lines 2, 3, 4, 5, 6, and 7 are all in layaway status. Modifications and expansion efforts continue to be directed by Norris Industries, again with the assistance of Bechtel.

In 1975-1976, the 60-mm mortar projectile line (Line 1) was expanded to produce 81-mm mortar projectiles.²² At present, the 81-mm process begins with the nicking and breaking of steel bars into billets of appropriate length (Building 120). The billets then are extruded to their rough shape and length (Building 8). Finally, they are subjected to a series of turning, heat-treating, cleaning, and threading operations to produce the projectile's proper shape, dimension, and hardness (Building 1). The completed projectiles then are shipped to load-assemble-and-pack installations for explosives, fuzes, and stabilizing fins.

On December 7, 1976, RBAAP's eighth line was established (Building 6). This line produces M42/M46 grenade-body assemblies for use in 155-mm M483 and 8" M509 cargo-load projectiles.²³ Once again, the production process begins in Building 120, where steel plate is spheroidized, embossed,

annealed, and blanked. In Building 13, the blanks are cupped and drawn to their final cannister-like shape and shouldered and pierced. Machining of primer retaining grooves, additional heat-treating, and placing of alignment studs complete the grenade-body assembly for shipment.

NOTES

1. Of the RBAAP'S 172.71 total acres, the plant proper occupies only 98.5 acres. The remaining acreage is allocated as follows: 36.5 acres, grazing lease; 6.96 acres, bounding roads and right-of-way; 1.75 acres, easements; and 29 acres, waste treatment settlement ponds remotely located, approximately 1-1/2 miles to the north of the plant on the Stanislaus River.
2. "Army Ammunition Plant Profile, Riverbank AAP," p. 1, unpublished brochure, n.d., in government files, RBAAP.
3. James H. Cleland, and others, "An Archeological Overview and Management Plan for the Riverbank Army Ammunition Plant, Riverbank, California," pp. 3-4, 3-5, unpublished draft, July 1, 1983, in government files, RBAAP.
4. ALCOA designed, built, and operated aluminum reduction plants in Portland, Oregon; Vancouver, Washington; Los Angeles, California (the Vernon Works); Massena, New York; and Arkansas. Their alumina production facilities were in Mobile, Alabama; East St. Louis, Illinois; and Arkansas. Also, ALCOA assisted in the design, construction, and personnel training at several western aluminum plants operated by other companies. An overview of World-War-II-era aluminum production is found in "More and More Aluminum for National Defense," Chemical & Metallurgical Engineering, 48 (September 1941), 106-107.
5. "Army Ammunition Plant Profile, Riverbank AAP," p. 1.
6. "Riverbank Aluminum Plant," p. 12, unpublished report prepared for Stanislaus County Board of Supervisors, August 1, 1950, in Modesto-Stanislaus Library, Modesto, California.
7. The RBAAP's layout was virtually identical to ALCOA's 1940-1941 facility in Vancouver, Washington. Its annual production capacity was 150,000,000 pounds. The plant is illustrated in "More and More Aluminum for National Defense," p. 107. Ore tanks and their

associated overhead rail conveying system are no longer extant. According to John Decker, Facilities Engineer, Norris Industries, RBAAP, the equipment was removed about 1957.

8. A discussion of alumina and aluminum production is found in R. Norris Shreve, The Chemical Process Industries (New York: McGraw-Hill, 1956), pp. 315-319; and in James A. Lee, "Making Alumina at Mobile," Chemical & Metallurgical Engineering, 47 (October 1940), 674-677.
9. Equipment in the Rectifier Building converted alternating current to direct current. This equipment and the bank of exterior transformers are no longer extant. According to Dennis Armstrong, Plant Equipment Manager, RBAAP, electrical bus bars were fabricated from silver on loan from the Denver Mint, because copper was in short supply. The silver eventually was salvaged and returned to Denver. Also see Shreve, p. 318.
10. R. J. Hammond, "Profile on Munitions, 1950-1977," pp. 36-37, unpublished report on microfiche, n.d., in AMCCOM Historical Office, Rock Island Arsenal. According to John Decker, an additional factor contributing to the plant's closing was a 1944 damage suit brought by nearby farmers. Fluoride dust emissions from the production process damaged crops and adversely affected livestock. Also see Cleland, p. 2-29.
11. "Sect'y of Army Inspects Remodeled Aluminum Facility; Operations Are Top Secret," The Stockton Record, September 20, 1952.
12. "Riverbank Aluminum Plant," p. 1. According to John Decker, the idle plant was used for limited government storage, directed by Haslett Warehousing Corporation, San Francisco. In addition, grain was stored in the abandoned ore storage tanks and in Building 9.
13. In 1952 the Riverbank Army Ammunition Plant was officially designated the Riverbank Ordnance Plant. The plant's current name is used throughout this report for the sake of brevity and clarity; "Army Ammunition Plant Profile, Riverbank AAP," p. 1; "Sect'y of Army Inspects Remodeled Aluminum Facility."
14. In 1952 Norris Industries' company name was Norris-Thermador Corporation. The company's current name is used throughout this report. An overview of Norris Industries' defense-related work is found in Kenneth T. Norris, "The Story of Norris Industries, Inc.: From Job Shop to Industrial Giant," unpublished address, January 24, 1972, in government files, RBAAP. Also see "Army Ammunition Plant Profile, Riverbank, AAP," pp. 11-12.
15. See Bechtel Corporation construction drawings in contractor files, RBAAP.
16. "Army Ammunition Plant Profile, Riverbank AAP," p. 1.

17. "Sect'y of Army Inspects Remodeled Aluminum Facility." Also see "DARCOM Installation and Activity Brochure," p. 1, unpublished, June 30, 1980, in government files, RBAAP.
18. "Army Ammunition Plant Profile, Riverbank AAP," p. 1.
19. "Army Ammunition Plant Profile, Riverbank AAP," p. 1.
20. Hammond, p. 37.
21. "Army Ammunition Plant Profile, Riverbank AAP," p. 1.
22. "Army Ammunition Plant Profile, Riverbank AAP," p. 1.
23. "Army Ammunition Plant Profile, Riverbank AAP," pp. 1-2.

Chapter 3

PRESERVATION RECOMMENDATIONS

BACKGROUND

Army Regulation 420-40 requires that an historic preservation plan be developed as an integral part of each installation's planning and long-range maintenance and development scheduling.¹ The purpose of such a program is to:

- Preserve historic properties to reflect the Army's role in history and its continuing concern for the protection of the nation's heritage.
- Implement historic preservation projects as an integral part of the installation's maintenance and construction programs.
- Find adaptive uses for historic properties in order to maintain them as actively used facilities on the installation.
- Eliminate damage or destruction due to improper maintenance, repair, or use that may alter or destroy the significant elements of any property.
- Enhance the most historically significant areas of the installation through appropriate landscaping and conservation.

To meet these overall preservation objectives, the general preservation recommendations set forth below have been developed:

Category I Historic Properties

All Category I historic properties not currently listed on or nominated to the National Register of Historic Places are assumed to be eligible for

nomination regardless of age. The following general preservation recommendations apply to these properties:

- a) Each Category I historic property should be treated as if it were on the National Register, whether listed or not. Properties not currently listed should be nominated. Category I historic properties should not be altered or demolished. All work on such properties shall be performed in accordance with Sections 106 and 110(f) of the National Historic Preservation Act as amended in 1980, and the regulations of the Advisory Council for Historic Preservation (ACHP) as outlined in the "Protection of Historic and Cultural Properties" (36 CFR 800).
- b) An individual preservation plan should be developed and put into effect for each Category I historic property. This plan should delineate the appropriate restoration or preservation program to be carried out for the property. It should include a maintenance and repair schedule and estimated initial and annual costs. The preservation plan should be approved by the State Historic Preservation Officer and the Advisory Council in accordance with the above-referenced ACHP regulation. Until the historic preservation plan is put into effect, Category I historic properties should be maintained in accordance with the recommended approaches of the Secretary of Interior's Standards for Rehabilitation and

Revised Guidelines for Rehabilitating Historic Buildings² and in consultation with the State Historic Preservation Officer.

- c) Each Category I historic property should be documented in accordance with Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) Documentation Level II, and the documentation submitted for inclusion in the HABS/HAER collections in the Library of Congress.³ When no adequate architectural drawings exist for a Category I historic property, it should be documented in accordance with Documentation Level I of these standards. In cases where standard measured drawings are unable to record significant features of a property or technological process, interpretive drawings also should be prepared.

Category II Historic Properties

All Category II historic properties not currently listed on or nominated to the National Register of Historic Places are assumed to be eligible for nomination regardless of age. The following general preservation recommendations apply to these properties:

- a) Each Category II historic property should be treated as if it were on the National Register, whether listed or not. Properties not currently listed should be nominated. Category II historic properties should not be altered or demolished. All work on such properties shall be performed

in accordance with Sections 106 and 110(f) of the National Historic Preservation Act as amended in 1980, and the regulations of the Advisory Council for Historic Preservation (ACHP) as outlined in the "Protection of Historic and Cultural Properties" (36 CFR 800).

- b) An individual preservation plan should be developed and put into effect for each Category II historic property. This plan should delineate the appropriate preservation or rehabilitation program to be carried out for the property or for those parts of the property which contribute to its historical, architectural, or technological importance. It should include a maintenance and repair schedule and estimated initial and annual costs. The preservation plan should be approved by the State Historic Preservation Officer and the Advisory Council in accordance with the above-referenced ACHP regulations. Until the historic preservation plan is put into effect, Category II historic properties should be maintained in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Revised Guidelines for Rehabilitating Historic Buildings⁴ and in consultation with the State Historic Preservation Officer.

- c) Each Category II historic property should be documented in accordance with Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) Documentation Level

II, and the documentation submitted for inclusion in the HABS/HAER collections in the Library of Congress.⁵

Category III Historic Properties

The following preservation recommendations apply to Category III historic properties:

- a) Category III historic properties listed on or eligible for nomination to the National Register as part of a district or thematic group should be treated in accordance with Sections 106 and 110(f) of the National Historic Preservation Act as amended in 1980, and the regulations of the Advisory Council for Historic Preservation as outlined in the "Protection of Historic and Cultural Properties" (36 CFR 800). Such properties should not be demolished and their facades, or those parts of the property that contribute to the historical landscape, should be protected from major modifications. Preservation plans should be developed for groupings of Category III historic properties within a district or thematic group. The scope of these plans should be limited to those parts of each property that contribute to the district or group's importance. Until such plans are put into effect, these properties should be maintained in accordance with the recommended approaches in the Secretary of the Interior's Standards for Rehabilitation and Revised

Guidelines for Rehabilitating Historic Buildings⁶ and in consultation with the State Historic Preservation Officer.

- b) Category III historic properties not listed on or eligible for nomination to the National Register as part of a district or thematic group should receive routine maintenance. Such properties should not be demolished, and their facades, or those parts of the property that contribute to the historical landscape, should be protected from modification. If the properties are unoccupied, they should, as a minimum, be maintained in stable condition and prevented from deteriorating.

HABS/HAER Documentation Level IV has been completed for all Category III historic properties, and no additional documentation is required as long as they are not endangered. Category III historic properties that are endangered for operational or other reasons should be documented in accordance with HABS/HAER Documentation Level III, and submitted for inclusion in the HABS/HAER collections in the Library of Congress.⁷ Similar structures need only be documented once.

CATEGORY I HISTORIC PROPERTIES

There are no Category I historic properties at the RBAAP.

CATEGORY II HISTORIC PROPERTIES

There are no Category II historic properties at the RBAAP.

CATEGORY III HISTORIC PROPERTIES

There are no Category III historic properties at the RBAAP.

NOTES

1. Army Regulation 420-40, Historic Preservation (Headquarters, U.S. Army: Washington, D.C., 15 April 1984).
2. National Park Service, Secretary of Interior's Standards for Rehabilitation and Revised Guidelines for Rehabilitating Historic Buildings, 1983 (Washington, D.C.: Preservation Assistance Division, National Park Service, 1983).
3. National Park Service, "Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines," Federal Register, Part IV, 28 September 1983, pp. 44730-44734.
4. National Park Service, Secretary of the Interior's Standards.
5. National Park Service, "Archeology and Historic Preservation."
6. National Park Service, Secretary of the Interior's Standards.
7. National Park Service, "Archeology and Historic Preservation."

BIBLIOGRAPHY

Army Ammunition Plant Profile, Riverbank AAP." n.d. Government files, RBAAP. An information brochure that provides historical and production overviews.

Cleland, James H., and others. "An Archeological Overview and Management Plan for the Riverbank Army Ammunition Plant, Riverbank, California." Unpublished draft report prepared by Wirth Associates, Inc., for DARCOM and the National Park Service, U.S. Department of the Interior, San Francisco, California, July 1, 1983. Government files, RBAAP. Provides pre-military overview of the area and a bibliography.

"DARCOM Installation and Activity Brochure." June 30, 1980. Government files, RBAAP. Provides historical and production overviews.

DARCOM Installation Inventory of Military Real Property. Computer print-out, December 31, 1981. Government files, RBAAP.

Fine, Lenore, and Remington, Jesse A. The Corps of Engineers: Construction in the United States. Washington, D.C.: Office of the Chief of Military History, United States Army, 1972. The standard study of government-owned munitions plant construction during World War II.

"Flow Chart: Grenade M42/M46 MPTS." n.d. Government files, RBAAP. A flow diagram for metal parts production.

Hammond, R.J. "Profile on Munitions, 1950-1977." n.d. On microfiche, AMCCOM Historical Office, Rock Island Arsenal.

Historic American Buildings Survey/Historic American Engineering Record, National Park Service. Guidelines for Inventories of Historic Buildings and Engineering and Industrial Structures. Unpublished draft, 1982.

Lee, James A. "Making Alumina at Mobile." Chemical & Metallurgical Engineering, 47 (October 1940), 674-677. An overview of the aluminum production process.

"More and More Aluminum for National Defense." Chemical & Metallurgical Engineering, 48 (September 1941), 106-107. An overview of aluminum plant construction in the western United States.

National Park Service. How to Complete National Register Forms. Washington, D.C.: U.S. Government Printing Office, 1977.

_____. Secretary of the Interior's Standards for Rehabilitation and Revised Guidelines for Rehabilitating Historic Buildings, 1983. Washington, D.C.: Preservation Assistance Division, National Park Service, 1983.

Norris, Kenneth T. "The Story of Norris Industries, Inc.: From Job Shop to Industrial Giant." Newcomen Address before the National Meeting of the Newcomen Society in North America, Los Angeles, California, January 24, 1972. Government files, RBAAP. An historical overview of Norris Industries.

"Riverbank Aluminum Plant." Report prepared in the Office of the County Engineer for the Stanislaus County Board of Supervisors, August 1, 1950. Modesto-Stanislaus Library, Modesto, California. Contains a site plan, building descriptions and photographs.

Riverbank Army Ammunition Plant Plot Plan. Drawing Number E-6548, prepared by Norris Industries, August, 17, 1970. Government files, RBAAP.

Riverbank Plant Layout. Drawing Number B9003-A4, prepared by Aluminum Company of America for Defense Plant Corporation, June 20, 1942, revised September 20, 1945. Contractor files, RBAAP.

Shreve, R. Norris. The Chemical Process Industries. New York: McGraw-Hill, 1956. A standard text on chemical technology.

"Sect'y of Army Inspects Remodeled Aluminum Facility; Operations Are Top Secret." The Stockton Record, September 20, 1952.